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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,685	09/30/2004	Greg A. Hanlon	PES-0220	5684

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EXAMINER

LEE, CYNTHIA K

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/711,685	Applicant(s) HANLON ET AL.	
	Examiner Cynthia Lee	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Amendment

This Office Action is responsive to the amendment filed on 10/9/2006. Claims 24 and 25 have been added and thus, claims 1-25 are pending. Claims 1, 13, and 20 have been amended.

The Double Patenting Rejection has been withdrawn due to Applicant's filing of a Terminal Disclaimer.

The 35 USC 112, 2nd paragraph rejection has been withdrawn.

Applicant's arguments have been considered, but are not persuasive. Claims 1-25 are finally rejected for reasons of record and necessitated by Applicant's amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-23 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed does not support "a first (or second) metallic seal disposed between the first (or second) layer and the third layer and comprising material from the first (or second) layer and the third layer." The newly added limitation is much broader than what was disclosed on par.

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[0020] because it can be interpreted to mean an additional layer between the first layer and third layer. The Examiner would be favorable disposed to remove the new matter rejection if the Applicant reinstated the language “wherein the first layer and third layer are metallurgically bonded together to define a first bond line that encompasses the first plurality of channels, the first inlet port and the first outlet port.”

Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification as originally filed does not support “the first [second] metallic seal is absent between the first [second] plurality of through-hole channels” (emphasis added). Although Fig. 5 depicts a seal around the periphery of the plate, the claim language needs to be constructed by what is present, and not by what is not present.

Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not support “a plurality of layers bonded together to form a laminated arrangement, each layer having features

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formed individually therein, the features being selected from at least one of through-hole channels, through-hole header channels, through-hole inlet ports and through-hole outlet ports, the features configured and disposed to provide fluid flow coordination from layer to layer” because it is much broader than the invention supported by the specification.

The specification does not support “a plurality of metallic seals, each metallic seal disposed between two adjacent layers, each metallic seal comprising material from each respective adjacent layer, each metallic seal configured to define a bond line that encompasses a plurality of the features, each metallic seal configured and disposed to prevent fluid communication across the respective metallic seal” because it is much broader than the invention supported by the specification.

Claims Analysis

The examiner has interpreted the term “through channel” to mean “the presence of a slot or a hole that is made in the respective part (layer)” as disclosed in the specification (para. 28).

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 8-13, 16-25 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Spear (US 6051331).

Spear discloses a bipolar plate made of several layers. A bipolar plate comprises an anode flow field spacer platelet (first layer) (30-2), a cathode flow field spacer platelet (second layer) (30-6), and a cooling platelet (third layer) (30-4). The anode flow field spacer platelet and the cathode flow field spacer platelet have through-etched channels (10:50-65). The layers are bonded to each other (1:16 and 17:30-55). See Fig. 4. Thus, the bonding of the layers creates a bond line between each layer (applicant's claims 1, 13, and 20).

The first layer has a first plurality of channels oriented horizontally (Fig. 6A and 6B) and vertically. The second layer has a second plurality of channels oriented horizontally (Fig. 10A and 10B) and vertically. Thus, they are oriented 90 degrees from each other. An alternating arrangement of the MEA and bipolar plate comprise a fuel cell (claims 13 and 20).

The third layer has channels 18A and 78 (Fig. 8A) that are in fluid communication with the plurality of channels (12:15-67). Further, there are inlet (12 and 16) and outlet ports (18 and 34, Fig. 5) in fluid communication with the header channels (12, 16, 18A and 78, see fig. 8A). The header channels extend over an opposing end of the plurality of channels (applicant's claim 23). The inlets and outlets are diagonal from each other (applicant's claim 3).

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The third layer necessarily prevents fluid communication between the first plurality and second plurality of channels because the reactant gases in the first plurality and second plurality of channels do not mix (claims 1, 13, and 20).

The plates are made from bonded titanium or stainless steel (1:10-20) (applicant's claim 12 and 22).

Spear discloses that each platelet is diffusion bonded to each other (17:30-55). Spear discloses that the channels are through-etched (10:50-65). The anode flow field spacer platelet 30-2 is bonded to the cooling plate 30-4 via anode flow field platelet 30-3. When the anode flow field spacer platelet bonds to the anode flow field platelet, the regions encompassing the active area 25, humidification areas 35 and 40 and gas manifolds must necessarily bond. The bonding between anode flow field spacer platelet 30-2 and cooling plate 30-4 occurs on anode flow field platelet 30-3 and thus, the metallic seal comprises material from the first layer and the third layer.

Should Spear not anticipate Applicant's "metallic seal", Spear discloses window frame platelets (30-1 and 30-7) that encompasses the active area 25, humidification areas 35 and 40 and gas manifolds. The window frame platelet receives the EMA and not each platelet 30-2 through 30-6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to diffusion bond the anode flow field spacer platelet 30-2 and the anode flow field platelet 30-3 that encompasses the active area 25, humidification channels, and the manifolds for the benefit of separating each set of gas channels and manifolds (applicant's claim 24).

.....

Claims 4,5, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spear (US 6051331) as applied to appropriate claims above, and further in view of Wilson (US 2004/0197630).

Spear discloses that each plate is about 20 mils thick (5:50).

Spear does not disclose the dimensions of the channels. However, Wilson discloses a bipolar plate with a channel width of 0.8 mm and depth of 0.25 mm (0031; 0033, lines 5-6), thus clearly teaching that the groove dimensions are result effective variables. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the grooves on Spear's bipolar plates with the groove dimensions for the purposes of fine tuning the pressure drop of the reactant gases and improving the overall performance of the plate, as taught by Wilson (0031 lines 4-6; 0032 lines 5-8).

.....

Claims 6,7,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spear (US 6051331) as applied to appropriate claims above, and further in view of Toshihiro (JP 05-251097).

Toshihiro discloses a bipolar plate wherein the plate comprises grooves of different lengths, in which an upstream portion of a first side of the plate has one width

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and a downstream portion of the first side has a second width (fig. 1). This configuration was designed by Toshihiro so that the stay of condensed water in the gas channel grooves in the bipolar plate can be eliminated to eject the water quickly (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Spear's grooves with two of Toshihiro's bipolar plate facing back to back of each other wherein the larger width of the two widths on the first side is greater than the smaller width on the second side. The motivation would be for the purpose of improving condensed water elimination, as taught by Toshihiro.

Response to Arguments

The Examiner has clarified her position of the prior art Spear and thus, most of the arguments have been addressed above.

Applicant asserts that Spear's platelets do not have a defined bond line that encompasses a defined flow region, but with an overall diffusion bond that bonds the entire surface of one platelet to the entire surface of an opposing plate (pg. 18).

Since each platelet is diffusion bonded to an adjacent plate, the anode flow field spacer platelet necessarily outlines the active area channels, humidification channels, and the manifolds that form a bond line.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


SUSY TSANG-FOSTER
PRIMARY EXAMINER